

REMARKS/ARGUMENTS:

Claims 1, 3-10 and 12-16 are pending in this application, as this Amendment cancels claims 2 and 11. In the Office Action dated February 21st, 2006, the Examiner has rejected claims 1-6 and 8-9 under 35 USC 102(b) as anticipated by an article entitled "HIGH-T_c SUPERCONDUCTING ANTENNA-COUPLED MICROBOLOMETER ON SILICON" by Rice et al (hereinafter, Rice); has rejected claim 7 under 35 USC 103(a) as obvious over Rice in combination with US Pat. No. 6,563,118 B2 to Ooms et al (hereinafter, Ooms); has rejected claims 10-13 under 35 USC 103(a) as obvious over Rice in combination with US Pat. Publ. No. 2003/0222217 A1 to Luukanen (hereinafter, Luukanen); and has rejected claims 14-16 under 35 USC 103(a) as obvious over Rice in combination with Luukanen and Ooms.

This paper amends each of independent claims 1 and 8-10 with subject matter supported at page 8 lines 21-23 ("The support layer 44 ... is sufficiently strong in tension to support the thermal detector 22 in suspension."). Claim 1 is further amended with the subject matter of canceled claim 2, and claim 10 is amended with the subject matter of canceled claim 11. Claims 1 and 10 now recite that the conductive leads comprise three layers, similar to that originally recited in claims 8-9. Other claims are amended to correct dependency or antecedent basis given the amendments to claims 1 and 10.

The Office Action characterizes the YSZ layer of Rice as analogous to the buffer layer of dependent claims 2-6, but does not stipulate which specific layers of Rice are analogous to the layers recited at (original) independent claim 1. The rejection to claim 1 appears to assert Rice's YBCO layer as anticipating the claimed superconducting layer and to assert Rice's YSZ layer as anticipating the claimed support layer. No other reading is seen that would reasonably support the rejection. If true, then the rejection to claims 2-6 is improper because each of those dependent claims recite a further buffer layer for which Rice discloses no analogous third layer. Incorporating the subject matter of claim 2 into claim 1 as done herein is seen to render claim 1 novel over Rice. The remaining independent apparatus claims 8-9 also recite a three layer structure for the conductive leads and all independent claims are therefore seen to be in condition for allowance.

Rice is seen to disclose at most two layers (YSZ and YBCO) over the etch pit (see Rice at Figure 1b). Three layers (YSZ, YBCO and Au, excluding the Si substrate) exist in the Rice

completed device only at the antenna portions (see Rice at Figure 1a). During processing, three layers (YSZ, YBCO and Au) exist over the etch pit (see Rice at Figure 2c) but if YBCO is considered analogous to the claimed superconducting layer, there is no “buffer” layer between it and a support layer as claimed; at any given time there is only a single layer above or below the Rice YBCO layer, so the three layers that temporarily exist during processing in Rice are not in the relative disposition recited at amended claim 1. An additional ‘support’ layer is neither disclosed nor inherent; Rice explicitly discloses in the first sentence of page 99 that YSZ is *grown* on silicon, and no intervening epitaxial layer is seen in Rice. Rice uses silicon as the substrate in which the etch pit is formed, so once that etch pit is formed there remains no silicon underneath the YSZ layer that might be considered analogous to the claimed support layer. Were a support layer present in Rice underneath the YSZ layer, one would expect it to be shown in one of Rice’s many sectional views, or at least explained in text how it might be resistant to the etchant used to form the etch pit. Rice teaches neither.

Assertions that the Rice YSZ layer might function as both a support layer and a buffer layer would not undermine patentability. Each independent claim *structurally* distinguishes over Rice. See MPEP 2114 (“claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function” “[A]pparatus claims cover what a device *is*, not what a device *does*.” [italics in original, internal citation omitted]). The Examiner may find relevant the decision *In re Robertson*, 49 USPQ2d 1949, 1951 (Fed. Cir., 1999). There, the court held that claims drawn to a disposable diaper having three fastening elements was not anticipated either expressly or inherently by a reference that used two fastening elements to perform the same function. *In re Robertson* appears to be directly on point for the above distinction between the claimed three layers and Rice’s disclosed two layers.

Further, Rice appears to use the YBCO strip as both the microbolometer and the conductor to the antenna. See page 98 (“In this paper, we shall describe ... an antenna-coupled YBCO microbolometer on a silicon substrate.”) and Figures 1a-1b. Figure 1a of Rice clearly shows the YBCO strip as being directly in contact with each of Rice’s two separate antenna components. Claim 1 recites that the thermal detector unit is spaced from the antenna, whereas Rice’s YBCO strip is in contact with the antenna components.

In a related vein, each independent apparatus claim recites the thermal detector unit separately from the plurality of multi-layered conductive leads. To read Rice's single YBCO strip as anticipating both of these distinctly claimed elements (the detector and the leads) effectively reads one of them out of the claim, which is improper for an apparatus. Rice gives no indication that a portion of the YBCO strip that acts as the microbolometer is in any way different than the portions contacting the antenna components.

Independent method claim 10 is rejected as obvious over Rice in view of Luukanen. Luukanen is cited for its disclosure of a sacrificial layer as rendering obvious the claimed method element of depositing a fill material within a cavity of the substrate. The Applicant disagrees on two counts.

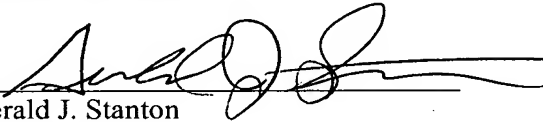
First, this rejection fails to set forth a *prima facie* case for obviousness, because there is no cavity in either Rice or Luukanen into which a filler material is deposited; Rice etches a pit directly from the substrate, and Luukanen disposes a sacrificial layer onto a substrate and etches into that sacrificial layer. See Luukanen at para. [0031] and Figure 3. In no instance is there a cavity into which filler material is disposed; in both teachings a pit or undercut is etched underneath what forms the air bridge, so filling that pit/undercut would defeat the very purpose of the Rice or Luukanen etch. Claim 10 recites separately defining a cavity in a substrate and removing filler material from that cavity. Antecedent basis in claim 10 requires that the filler material be deposited in the cavity *after* the cavity is defined in the substrate. Both Rice and Luukanen etch the etch pit after the microbolometer is formed, and therefore teach away from later filling it.

Second, the combination of Rice and Luukanen fails for the lack of three layers in a conductive lead as detailed in the argument regarding claims 1 and 8-9 above. Claim 10 is amended herein to recite three layers similar to those recited in the apparatus claims, and with the buffer layer disposed between the other two claimed layers. As detailed above, Rice discloses two layers and does not disclose or teach separate components for the thermal detector unit and the conductive leads. Luukanen discloses only one layer, a low-temperature superconductor, and similarly does not disclose or teach separate components for the thermal detector unit and the conductive leads. See Luukanen at Figures 2-3 and related text. The

further teachings of Ooms against dependent claims 14-16 are not seen to cure the above deficit within the asserted combination of Rice and Luukanen.

For at least the above reasons, each of claims 1, 3-10, and 12-16 are seen to be in condition for allowance. The Examiner is respectfully requested to review the cited art in view of the above detailed arguments. The Applicant is confident that an objective review will find the independent claims patentable over the cited art, in which case the Examiner is requested to withdraw the rejections and pass all remaining claims to issue. The undersigned representative welcomes the opportunity to resolve any matters that may remain, formal or otherwise, via teleconference at the Examiner's discretion.

Respectfully submitted:



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